

**Features**

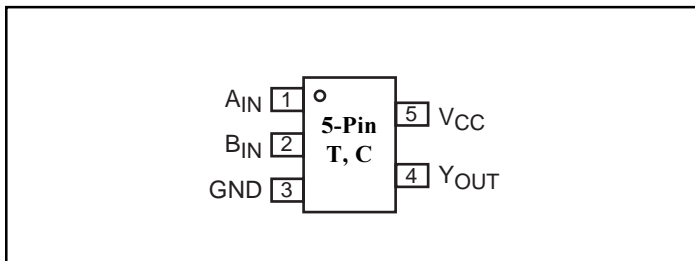
- High-speed:  $t_{pD} = 2.4\text{ns}$  typical into  $50\text{pF}$  @  $5\text{V } V_{CC}$
- Broad operating range:  $V_{CC} = 1.65\text{V} - 5.5\text{V}$
- Power down high-impedance inputs/outputs
- High output drive:  $\pm 24\text{mA}$  at  $3\text{V } V_{CC}$
- Package: 5-pin space saving SOT23 and SC70

**Description**

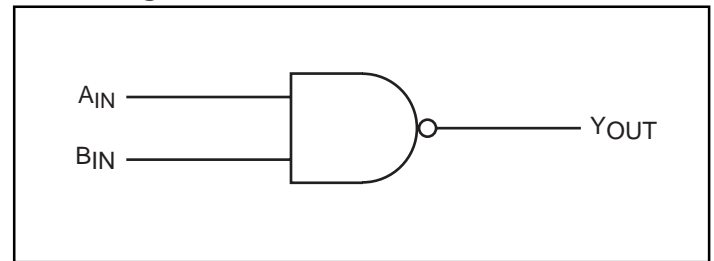
The PI74STX1G00 is a 2-input NAND gate that operates over the  $1.65\text{V}$  to  $5.5\text{V } V_{CC}$  operating range.

Pericom's PI74STX series of products are produced using the Company's advanced submicron technology.

**Pinout**



**Block Diagram**



**Pin Description**

Pin Names	Description
A <sub>IN</sub>	Input
B <sub>IN</sub>	Input
Y <sub>OUT</sub>	Output

**Function Table**

Inputs		Output
A <sub>IN</sub>	B <sub>IN</sub>	Y <sub>OUT</sub>
L	L	H
L	H	H
H	L	H
H	H	L

**Note:**  
H = HIGH Logic Level  
L = LOW Logic Level

**Recommended Operating Conditions<sup>(1)</sup>**

Parameter	Condition	Min.	Max.	Units
Supply Voltage ( $V_{CC}$ )		1.65	5.5	V
Input Voltage ( $V_{IN}$ )		0	5.5	
Output Voltage ( $V_{OUT}$ )		0	$V_{CC}$	
Operating Temperature		-40	85	°C
Input Rise and Fall Time ( $t_r, t_f$ )	$V_{CC} = 1.8\text{V}, 2.5\text{V} \pm 0.2\text{V}$	0	20	ns/V
	$V_{CC} = 3.3\text{V}, \pm 0.3\text{V}$	0	10	
	$V_{CC} = 5.0\text{V}, \pm 0.5\text{V}$	0	5	

**Note:**  
1. Unused inputs must be held HIGH or LOW. They may not float.

**Absolute Maximum Ratings**

Supply Voltage ( $V_{CC}$ ) .....	-0.5V to +6V	DC $V_{CC}/GND$ Current ( $I_{CC}/I_{GND}$ ) .....	$\pm 50$ mA
DC Input Voltage ( $V_{IN}$ ) .....	-0.5V to +6V	Storage Temperature ( $T_{STG}$ ) .....	-65°C to +150°C
DC Output Voltage ( $V_{OUT}$ ) .....	-0.5V to +6V	Junction Lead Temperature (IOS) .....	200°C
DC Input Diode Current ( $I_{IK}$ ) .....	-50mA to 20mA	Power Dissipation SOT23 .....	200mW
DC Output Diode Current ( $I_{OK}$ ) .....	-50mA to 20mA	SC70 .....	150mW
DC Output Current ( $I_{OUT}$ ) .....	$\pm 50$ mA		

**Note:**

Absolute maximum ratings are DC values beyond which the device may be damaged or have its useful life impaired. The datasheet specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. Pericom does not recommend operation outside datasheet specifications.

**DC Electrical Characteristics** (Over supply voltage and operating temperature ranges, unless otherwise specified)

Symbol	Parameter	$V_{CC}$ (V)	Conditions		$T_A = +25^\circ\text{C}$			$T_A = -40$ to $+85^\circ\text{C}$		Units	
					Min.	Typ.	Max.	Min.	Max.		
$V_{IH}$	HIGH Level Input Voltage	1.65-1.95 2.3-5.5			$0.75V_{CC}$ $0.70V_{CC}$			$0.75V_{CC}$ $0.70V_{CC}$		V	
$V_{IL}$	LOW Level Input Voltage	1.65-1.95 2.3-5.5					$0.25V_{CC}$ $0.30V_{CC}$	$0.25V_{CC}$ $0.30V_{CC}$			
$V_{OH}$	HIGH Level Output Voltage	1.65	$V_{IN} = V_{IL}$	$I_{OH} = -100\mu\text{A}$	1.55	1.65		1.55			
		1.8			1.7	1.79		1.9			
		2.3			2.2	2.29		2.4			
		3.0			2.	2.99		2.3			
		4.5			4.4	4.5		4.4			
		1.65				$I_{OH} = -4\text{mA}$	1.29	1.52			1.29
2.3		$I_{OH} = -8\text{mA}$	1.9	2.13		1.9					
3.0		$I_{OH} = -16\text{mA}$	2.4	2.71		2.4					
3.0		$I_{OH} = -24\text{mA}$	2.3	2.55		2.3					
4.5		$I_{OH} = -32\text{mA}$	3.8	4.20		3.8					
$V_{OL}$	LOW Level Output Voltage	1.65	$V_{IN} = V_{IH}$	$I_{OL} = 100\mu\text{A}$		0.01	0.1		0.1		
		1.8			0.01	0.1		0.1			
		2.3			0.01	0.1		0.1			
		3.0			0.00	0.1		0.1			
		4.5			0.00	0.1		0.1			
		1.65				$I_{OL} = 4\text{mA}$		0.08	0.24		0.24
		2.3				$I_{OL} = 8\text{mA}$		0.10	0.3		0.3
		3.0				$I_{OL} = 16\text{mA}$		0.18	0.4		0.4
		3.0				$I_{OL} = 24\text{mA}$		0.28	0.55		0.55
		4.5				$I_{OL} = 32\text{mA}$		0.28	0.55		0.55
$I_{IN}$	Input Leakage Current	0-5.5	$V_{IN} = 5.5\text{V}, GND$		-1		1	-1	1	$\mu\text{A}$	
$I_{OFF}$	Power Off Leakage Current	0.0	$V_{IN}$ or $V_{OUT} = 5.5\text{V}$		-1		1	-1	1		
$I_{CC}$	Quiescent Supply Current	1.65-5.5	$V_{IN} = 5.5\text{V}, GND$				2.0		20		

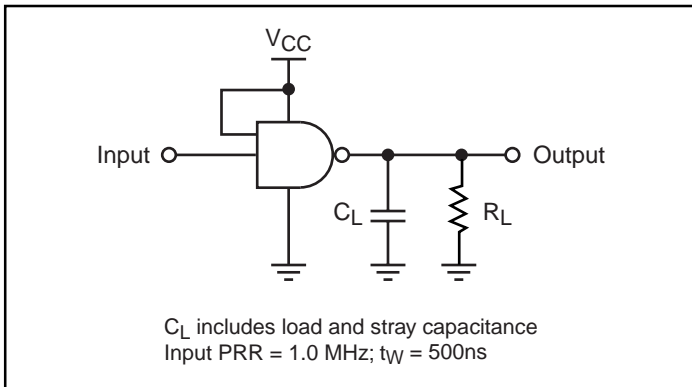
### AC Electrical Characteristics

Symbol	Parameter	V <sub>CC</sub> (V)	Conditions	T <sub>A</sub> = +25°C			T <sub>A</sub> = -40°C to +85°C		Units	Fig. No.
				Min.	Typ.	Max.	Min.	Max.		
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay	1.8 ±0.15	C <sub>L</sub> = 15pF, R <sub>L</sub> = 1 Mohm	0.7	5.4	6.6	0.7	7.3	ns	1 3
		2.5 ±0.2		0.5	3.2	4.1	0.5	4.5		
		3.3 ±0.3		0.5	2.4	3.2	0.5	3.5		
		5.0 ±0.5		0.5	1.9	2.5	0.5	2.8		
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay	3.3 ±0.3	C <sub>L</sub> = 50pF, R <sub>L</sub> = 500ohms	0.5	3.2	4.3	0.5	4.7	pF	1 3
		5.0 ±0.5		0.5	2.4	3.2	0.5	3.5		
C <sub>IN</sub>	Input Capacitance	0			4				pF	2
C <sub>PD</sub>	Power Dissipation Capacitance <sup>(3)</sup>	3.3 5.0			24 30					

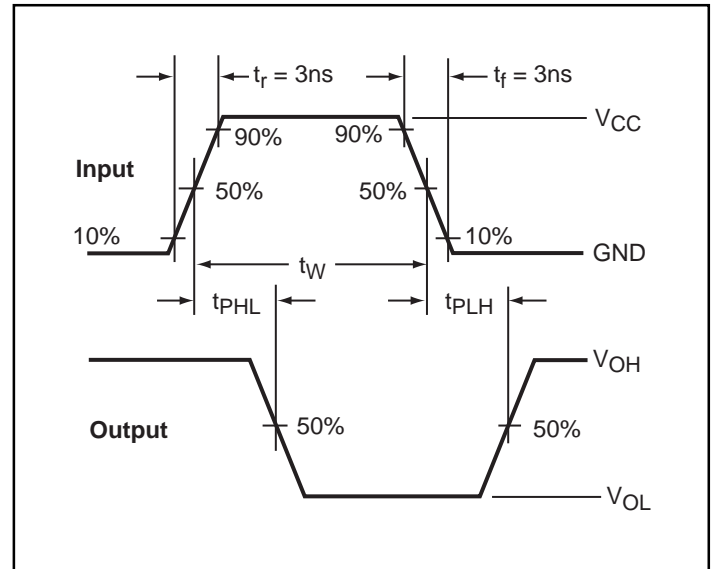
#### Notes:

3. C<sub>PD</sub> is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I<sub>CCD</sub>) at no output loading and operating at 50% duty cycle (see Figure 2). C<sub>PD</sub> is related to I<sub>CCD</sub> dynamic operating current by the expression: I<sub>CCD</sub> = (C<sub>PD</sub>)(V<sub>CC</sub>)(f<sub>IN</sub>) + (I<sub>CC</sub> static).

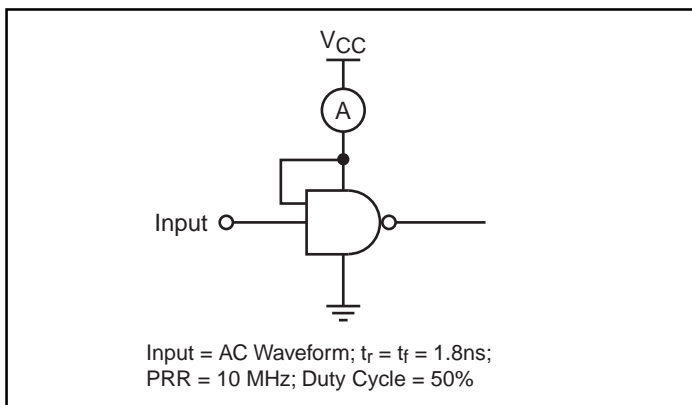
### AC Loading and Waveforms



**Figure 1. AC Test Circuit**

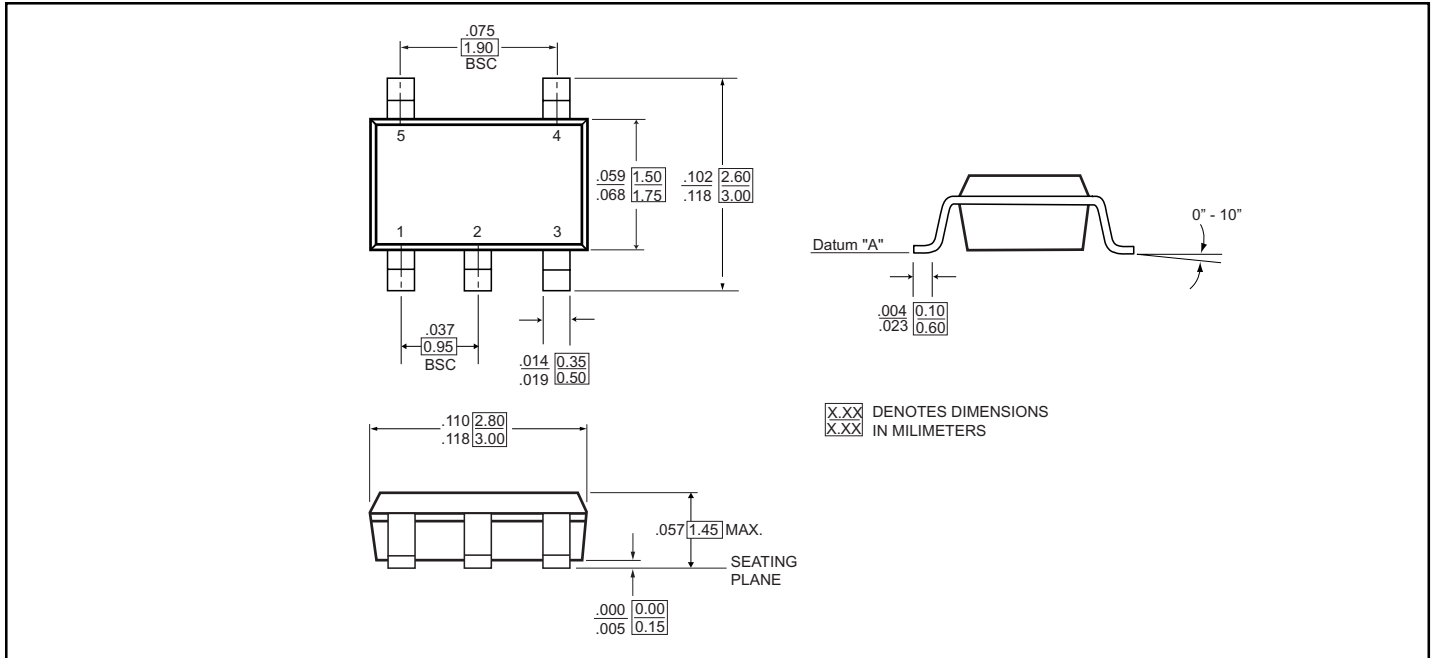


**Figure 3. AC Waveforms**

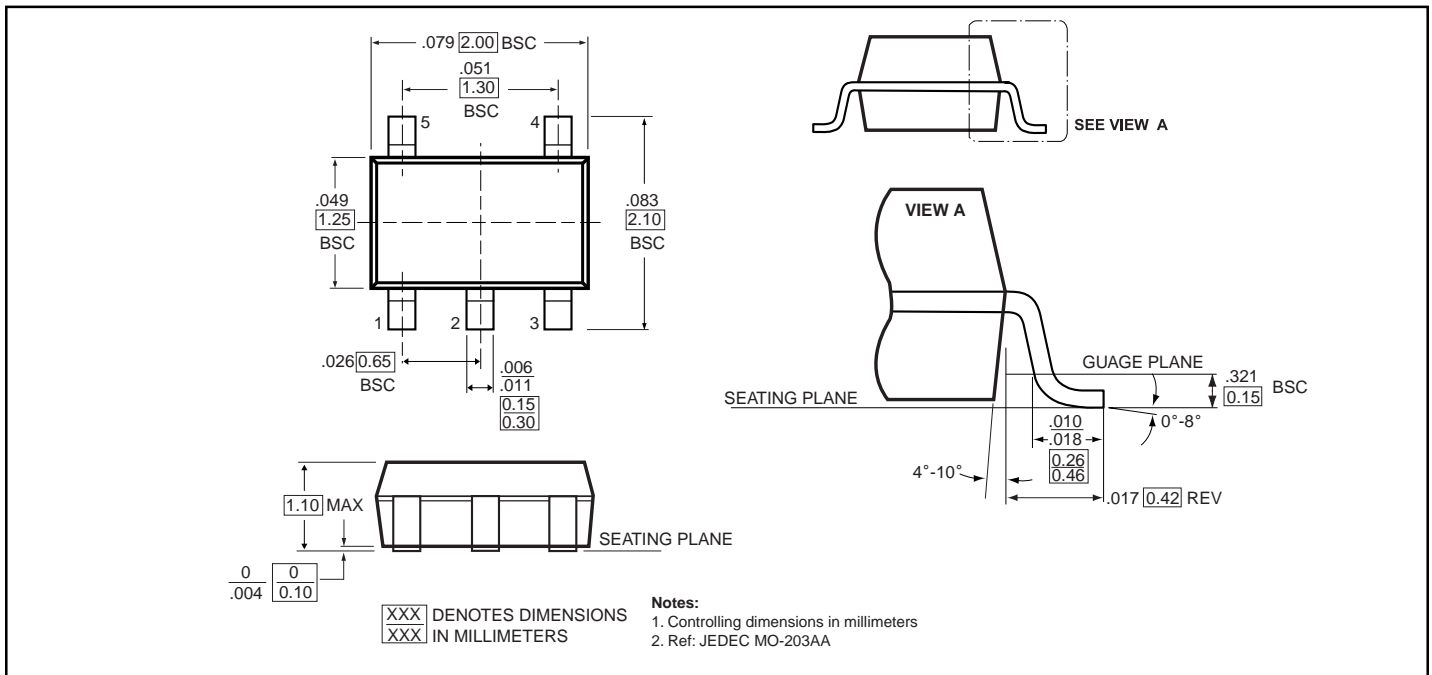


**Figure 2. I<sub>CCD</sub> Test Circuit**

### 5-Pin SOT23 (T) Package



### 5-Pin SC70 Package (C)



### Ordering Information

Part	Pin-Package	Top Marking	Operating Range
PI74STX1G00TX	5-Pin - SOT23	M00	-40°C to 85°C
PI74STX1G00CX	5-Pin - SC70	M00	-40°C to 85°C

**Pericom Semiconductor Corporation**

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